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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/772,699

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Leroy M. Edwards

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EXAMINER

WALKER, KEITH D

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

09/03/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/772,699	Applicant(s) EDWARDS ET AL.	
	Examiner KEITH WALKER	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Claims 1-5 & 7-20 are pending examination as discussed below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2, 4, 7 & 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2004/0001982 (Reiser) in view of US Patent 5,623,390 (Noda).

Reiser teaches a fuel cell system comprising a hydrogen flow path and a coolant flow path for cooling the fuel cell (Abstract; Fig. 4). The fuel cell system is included in a vehicle and therefore has an enclosure surrounding at least part of the cooling flow path. A coolant reservoir is part of the cooling flow path and the reservoir includes a vent. The vent does not require any active components and so is a passive vent. Since it vents gases, it is a hydrogen vent, configured to pass hydrogen gas. It is well known in the art that the fuel cell system in the vehicle would be located within open spaces and therefore since the enclosure is open and the vent passes the hydrogen gas to the enclosure, the vent is also configured to vent hydrogen from the enclosure.

Reiser is silent to limiting the concentration of hydrogen to below 4 percent.

Noda teaches a nickel-hydrogen battery. This electrochemical device expels hydrogen and is surrounded by an enclosure. The build up of hydrogen gas within the enclosure becomes unsafe due to the explosive nature of hydrogen. Therefore, hydrogen vents are used to pass the hydrogen gas out of the battery and then out of the enclosure. The concentration of hydrogen gas is kept to below 4 percent and preferable below 3 percent to prevent the enclosure from reaching an explosive concentration of hydrogen (9:5-25). Claims that differ from the prior art only by slightly different ranges are prima facie obvious without a showing that the claimed range achieves unexpected results relative to the prior art. (MPEP 2144.05) Discovery of optimum ranges of a result effective variable in a known process is ordinarily within the skill of art and selection of the optimum ranges within the general condition is obvious. (MPEP 2144.05)

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vent of Reiser with the hydrogen vent of Noda to prevent a build up of hydrogen gas within the enclosure, creating an explosive atmosphere. Combining prior art elements according to known methods to yield predictable results and using known techniques to improve similar devices in the same way are considered obvious to one of ordinary skill in the art (KSR, MPEP 2141 (III)).

2. Claims 1-5, 7-9, 11-16 & 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0160245 (Genc) in view of US 2004/0062964 (Matsuoka) and US Patent 5,623,390 (Noda).

The teachings of Noda as discussed above are incorporated herein.

Genc teaches a fuel cell system with a cooling loop for the fuel cell. The cooling loop includes a passive gas vent that enables the passage of gas but not liquid (Abstract, Fig. 1, [0007, 0010]). Hydrogen is part of the gas that is present in the cooling system liquid and so the vent is a hydrogen vent. The hydrogen vent is a porous material made of plastic or metal and is located in the wall of the coolant reservoir (Figs. 2-6; [0021-0023]).

Genc is silent to an enclosure encompassing a part of the cooling system or a second enclosure around at least part of the hydrogen flow or coolant path.

Matsuoka teaches a fuel cell system with an enclosure surrounding the entire fuel cell system. This enclosure houses the entire system, allowing for easy application integration (Figs. 1-5A; [0030, 0031, 0034, 0037 & 0040]). The concentration of the hydrogen within the enclosure is not expressly taught, however, reducing the amount of unnecessary gasses like hydrogen is taught and it would be obvious to one skilled in the art to rid the enclosure of as much hydrogen gas as possible with a best case being zero percent. The motivation to reduce the hydrogen gas in the container is for both safety and increased performance. While a second enclosure is not taught by Matsuoka, including a second enclosure is obvious to one skilled in the art. A second enclosure surrounding a different part of the fuel cell system such as the cooling system, the hydrogen fuel system or the fuel cell itself for any of more protection or isolation from other components of the system is obvious to one skilled in the art and it has been held that mere duplication of the working parts of a device involves only routine skill in the art (MPEP 2144.04). Combining prior art elements according to

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known methods to yield predictable results and using known techniques to improve similar devices in the same way are considered obvious to one of ordinary skill in the art (KSR, MPEP 2141 (III)).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the fuel cell system of Genc with the enclosure of Matsuoka to allow for easy application integration.

Regarding claim 19, the inclusion of a second vent in a second enclosure is obvious to one skilled in the art in light of the teachings presented. Genc and Marsuoka teach adding vents to enclosed spaces to get rid of unwanted gases. Therefore, by adding a second, third or fourth enclosure that has the ability to trap unwanted gases, it is obvious to one skilled in the art to add a vent to each of these enclosures to prevent the accumulation of the unwanted gases as taught by the prior art. Combining prior art elements according to known methods to yield predictable results and using known techniques to improve similar devices in the same way are considered obvious to one of ordinary skill in the art (KSR, MPEP 2141 (III)).

Genc is silent to limiting the concentration of hydrogen to below 4 percent.

Noda teaches a nickel-hydrogen battery. This electrochemical device expels hydrogen and is surrounded by an enclosure. The build up of hydrogen gas within the enclosure becomes unsafe due to the explosive nature of hydrogen. Therefore, hydrogen vents are used to pass the hydrogen gas out of the battery and then out of the enclosure. The concentration of hydrogen gas is kept to below 4 percent and preferable below 3 percent to prevent the enclosure from reaching an explosive concentration of

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hydrogen (9:5-25). Claims that differ from the prior art only by slightly different ranges are prima facie obvious without a showing that the claimed range achieves unexpected results relative to the prior art. (MPEP 2144.05) Discovery of optimum ranges of a result effective variable in a known process is ordinarily within the skill of art and selection of the optimum ranges within the general condition is obvious. (MPEP 2144.05)

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vent of Genc with the hydrogen vent of Noda to prevent a build up of hydrogen gas within the enclosure, creating an explosive atmosphere.

3. Claims 10 & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2002/0160245 (Genc) in view of US 2004/0062964 (Matsuoka) and US Patent 5,623,390 (Noda) as applied to claims 1 & 16 respectively and further in view of US Patent 4,168,349 (Buzzelli).

The teachings of Genc, Matsuoka and Noda as discussed above are incorporated herein.

Genc is silent to the vent acting like a flame barrier.

Buzzelli teaches a hydrogen vent that acts as a flame and explosion barrier (2:55-65). Using a hydrogen vent that also blocks flames increases the safety of the fuel cell system.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vent of Matsuoka with the flame barrier vent of Buzzelli to improve the safety of the fuel cell device.

4. Claims 10 & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2004/0001982 (Reiser) in view of US Patent 5,623,390 (Noda) as applied to claims 1 & 16 respectively and further in view of US Patent 4,168,349 (Buzzelli).

The teachings of Reiser, Noda and Buzzelli as discussed above are incorporated herein.

Response to Arguments

Applicant's arguments with respect to claims 1-5 & 7-20 have been considered but are moot in view of the new ground(s) of rejection as required by amendment.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 2004/0175608 (Lisi) teaches it is known that hydrogen gas is dissolved in the coolant stream and it is important to vent the hydrogen gas from the coolant loop. US 2003/0232228 (Grasso) teaches also teaches a fuel cell system with a coolant loop that incorporates a hydrogen vent to eliminate the build up of gas in the cooling system.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEITH WALKER whose telephone number is (571)272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K. Walker

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795